

平成 20 年 5 月 29 日
独立行政法人理化学研究所
播磨研究所 研究推進部

宮野構造生物物理研究室 研究業績レビュー（中間レビュー）報告

【対象研究室】

放射光科学総合研究センター 宮野構造生物物理研究室 宮野 雅司 主任研究員

【実施日】

平成 19 年 12 月 3 日

【レビュアー】

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中村 春木	大阪大学 蛋白質研究所
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【レビュー結果の要約】

2000 年に Science 誌へ発表したウシロドプシンの立体構造は、世界で初めて GPCR (G タンパク質共役型受容体) の構造を決定し、論文の引用回数も 2000 回を超えており特筆に値する。2007 年にはヒト LTC₄ 合成酵素の構造を Nature 誌に発表するなど、創薬につながる GPCR の解明の第一線を走り、機能解明の新しい地平を開いてきたことは高く評価できる。

共同発表論文はたくさんある中で、研究室としては 12 本の論文しか出ていない。これまでに Science と Nature に 1 本ずつ論文が掲載されているが、7 年間で 325 百万円という研究費の大きさを考えれば満足できる結果ではない。

レビューでは宮野主任より将来構想について充分語られたとはいえ、研究室の長として研究目標を明確にしていないところが問題。ただし研究員の能力は非常に高いので、宮野主任が目標を明確化することで彼らの研究活動がもっと刺激されるだろう。3~6 ヶ月程度のサバティカル制度を用いて新領域研究の模索と現在の研究の監督に当てることを推奨する。

【放射光科学総合研究センター長による指摘事項への対応】

宮野主任は、Science 誌、Nature 誌へ掲載された論文に端的に示されているように、時間をかけて大きな仕事をするタイプであるため、大学関係者からの評判は必ずしも高くない。しかしながら、当世大きくない仕事であっても連続的に出すことが流行している中で、自分のスタイルを貫いていることは評価すべきことであり、また理研の主任研究員であるからこそ短期的な流行に振り回されずに、じっくりと仕事を育てていると思われる。レビューで将来構想について多く語られていないという批判があり、サバティカルにでることがリコメン

ドされたので、放射光科学総合研究センターとして、短期サバティカルリープを支援することとした。

【レビュー結果概要】

- The Miyano group has focused on several areas of biomedical research, and has produced excellent results in each of these areas. In close collaboration with colleagues at the University of Washington, for example, Miyano's group solved the first detailed structure of bovine rhodopsin in 2000. This work, which was published in Science, has now been cited over 2000 times. The Structural Biophysics Laboratory, headed by Dr. Masashi Miyano, has continued to gain a strong reputation among national and international structural biology communities during the last 7 years.
- They contributed to the startup and the success of the Protein 3000 structural genomics project in RIKEN. In this project, they developed fully-automated crystallization and crystal-observation system TERA as well as protein expression procedures for structural and functional analyses. They also have made efforts to determine accurate structures at ultra-high resolutions. These achievements are highly remarked.
- With the completion of seven years' service as Chief Scientist, and the ending of the Protein 3000 project before advancing into new areas of research, now seems to be an excellent point in time for Dr. Miyano to consider a sabbatical experience for a period of 3 to 6 months. During this refreshing period, Dr. Miyano may want to devote 50% of his efforts towards exploring new collaborations and possibilities, while also keeping the other 50% available for supervising his current research projects remotely. This will likely add new insight and strength to the operations of the laboratory, which is already highly innovative and productive.
- Total only 12 papers are considered to have been published from this group, although there are many collaborative papers with other researchers inside or out of RIKEN. Although the group published one Science and one Nature paper during the period, the resulted publications are not very satisfactory, considering the total research budget, 325 MYen, spent from years 2000 to 2006.

- Their directions seem highly promising since their past scientific achievements are measured in excellence. Their cooperative involvement in synchrotron X-ray crystallography as well as in structural biology itself is fully anticipated. They are expected to play important roles in protein research activities which will be carried out by using powerful XFEL radiation in the near future. Overall, the activities of the scientists of this Laboratory are assessed in a high and valuable rank.
- All the members of Structural Biophysics Laboratory are quite talented and enthusiastic in their research subjects and thus, their future progress as the world-leading scientist is definitely promising. Setting the clear objective to these young research group members from the Chief Scientist would surely stimulate their research activities.
- This field is now very hot in the world, and so international collaborations are critical. However, this group has very rare international collaborations, and has no foreign staffs. The abilities of English speaking of the members are not quite high except the group leader, as the Japanese researchers' standard.
- Management of the Laboratory appeared very good. Laboratory members are composed of talented and skilled professionals in excellently-managed scientific atmosphere, and collaborating with a wide variety of researchers. The members cover most of the technical fields required in modern protein crystallography. Laboratory facilities are well equipped and maintained. They are fully taking great advantage in using synchrotron X-rays of SPring-8 located in the same site.